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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/646,907	10/10/2000	Hidetaka Sakai	P107314-0001	6185

7590 03/19/2004  
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EXAMINER
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AKHAVANNIK, HUSSEIN

ART UNIT	PAPER NUMBER
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2621

DATE MAILED: 03/19/2004

11

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/646,907

Applicant(s)

SAKAI ET AL.

Examiner

Hussein Akhavannik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. The substitute abstract overcomes the Examiner's objection cited in paragraph 1 of the previous office action (now Paper No. 7).
2. The amendments to the specification overcome the Examiner's objections cited in paragraph 2 of the previous office action (now Paper No. 7).

### ***Drawings***

3. The drawings were received on December 24, 2003. These drawings are accepted.

### ***Response to Arguments***

4. Applicant's arguments filed December 24, 2003 have been fully considered but they are not persuasive.

The Applicant alleges that Vaks does not disclose or suggest analyzing principle components on the basis of obtained results of the measurement to find an equation of a straight line corresponding to the predetermined principle component on page 9, lines 11-15 and 20-23 of the remarks. The Examiner respectfully disagrees. Each axis of figures 4 and 5 represent a measurement of a characteristic amount of coin. The equations,

a.  $P_1 = M_1$

b.  $P_2 = M_2$

c.  $P_3 = M_3$

in figure 4 and

a.  $P_1/(S_1 * D_1) = M_1/(S_1 * D_1)$

b.  $P_2/(S_2 * D_2) = M_2/(S_2 * D_2)$

c. 
$$P_3/(S_3 * D_3) = M_3/(S_3 * D_3)$$

in figure 5 each represent equations of straight lines. Each of these equations represents a straight line that is perpendicular to its respective axis and intersects the midpoint of the measurements (column 5, lines 34-36). Therefore, each straight line divides the data evenly into two halves, exactly as illustrated by the Applicant in figure 4. Claim 1 does not require that the equations of the straight lines be calculated through sum of the squares as explained in page 8, lines 3-12 of the specification. Thus, the straight lines illustrated by Vaks do analyze principle components (corresponding to each measurement represented on each axis) and the equations for each straight line are illustrated by Vaks in figures 4 and 5.

The Applicant alleges that the present invention solves the problem of counterfeit bills being produced to give sensors valid data corresponding to genuine money, as possible in Vaks, by measuring a plurality of types of characteristic amounts by a plurality of sensors for each of a plurality of portions for examination previously determined on page 10, lines 9-15 of the remarks. The Examiner respectfully disagrees. Vaks illustrates in figure 5 that the center point of the sphere, M, is determined by the intersection of equations of the straight lines explained by Vaks and is used as a base for a vector to determine genuine coins. K is the radius of a sphere encompassing an acceptable coin region, which is determined from previous examination of a plurality of portions of the coins. Vaks compares the magnitude of the vector to the radius, K, in order to determine the genuineness of currency.

The Applicant alleges that Vaks broadly recites bank note validation and that claim 8 of Vaks is clearly different than the method of the claimed invention on page 10, line 16 to claim 11, line 2 of the remarks. The Examiner respectfully points the Applicant to column 1, lines 10-

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11 of Vaks, wherein Vaks anticipates using this system for validation of bank notes.

Furthermore, Claim 8 is a broad recitation of the invention described by Vaks and does not exclude the details of the invention. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the invention of Vaks, which validates coins, to validate banknotes (or paper currency) as Vaks suggests such an alternative.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vaks (U.S. Patent No. 5,615,760).

Referring to claim 1,

i. Measuring, with respect to each of true paper types previously prepared, a plurality of types of characteristic amounts by a plurality of types of sensors for each of a plurality of portions for examination is explained by Vaks in column 5, lines 10-33 and illustrated in figures 4-5. Vaks explains that the region  $R_A$  corresponds to the region where items are statistically likely to be acceptable coins. Vaks explains in column 4, lines 37-56 that the acceptable region is dependent on the three measured characteristic amounts including conductivity, thickness, and diameter of the currency. Though Vaks does not explicitly explain the currency being a paper type, Vaks does explain that the currency validation system can be used to validate banknotes in column 1, lines 10-11.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the invention of Vaks, which validates coins, to validate banknotes (or paper currency) as Vaks suggests such an alternative.

ii. Analyzing principle components on the basis of obtained results of the measurement to find an equation of a straight line corresponding to the predetermined principle component is illustrated by Vaks in figure 5 by the straight lines:

a.  $P_1/(S_1 * D_1) = M_1/(S_1 * D_1)$

b.  $P_2/(S_2 * D_2) = M_2/(S_2 * D_2)$

c.  $P_3/(S_3 * D_3) = M_3/(S_3 * D_3)$

The intersection of these three lines corresponds to the statistical mean, M, of the principle components measured for the true currency (column 5, lines 34-36).

iii. Producing reference data composed of a value relating to the predetermined principle component for the portion for examination on the basis of the found equation of the straight line is illustrated by Vaks in figure 5 by center point of the sphere, M, and the radius of the sphere, K (column 6, lines 1-8). The center point of the sphere, M, is determined by the intersection of equations of the straight lines explained by Vaks and is used as a base for a vector (explained in part v of this claim) to determine genuine coins. K is the radius of a sphere encompassing an acceptable coin region, which is determined from previous examination of a plurality of portions of the coins.

iv. Measuring, with respect to the paper types to be examined, the plurality of types of characteristic amounts by the plurality of types of sensors for each of the plurality of portions for examination previously determined is illustrated by Vaks in figure 5 by point

P. Vaks explains in column 6, lines 17-22 that the point P represents the measured properties of a coin using the same plurality of sensors used to create the acceptable region  $R_A$ .

v. Producing data for examination composed of a value relating to the predetermined principle component for the position for examination on the basis of obtained results of the measurement and the equation of the straight line is explained by Vaks in column 6, lines 1-11 and illustrated in figure 5 by the vector  $V$ . The vector  $V$  is created from the midpoint M (center of gravity) of the acceptable region to the point P of the measured characteristics of a suspect coin. The data for examination of the vector (straight line) corresponds to the magnitude of the vector calculated by Vaks in column 5, lines 52-55.

vi. Comparing the reference data and the data for examination to judge the truth of the paper type to be examined is explained by Vaks in column 6, lines 1-8. If the data for examination (magnitude of vector  $V$ ) is less than K, then the coin is determined to fall in the acceptable region  $R_A$  (column 5, lines 56-67) and is determined to be valid.

7. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaks in view of Ishida et al (U.S. Patent No. 5,419,423).

Referring to claim 2, using a magnetic sensor and a light sensor as the plurality of sensors is not explicitly explained by Vaks. However, Ishida et al explain in column 4, lines 41-55 that a visible light sensor and a magnetic sensor are used in combination to determine whether a paper note is false or genuine. It is well known in the art that paper currency typically contains magnetic ink that can be detected using a magnetic sensor. Furthermore, images present on paper currency can be detected using a light sensor, as is also well known in the art. Therefore, it

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would have been obvious to one of ordinary skill in the art at the time the invention was made to use a magnetic sensor and a light sensor in order to determine genuine paper currency as both sensors can detect distinct patterns present on different types (or denominations) of bills.

Referring to claim 3, using a red-light sensor and an infrared light sensor as the plurality of sensors is not explicitly explained by Vaks. However, Ishida et al explain in column 7, lines 20-28 that the optical sensors, Pxl and PxR, use infrared light and the optical sensor, PxC, uses red light. Using multiple wavelengths of light in order to determine a pattern on a suspect bill would increase the accuracy of the currency detection of Vaks, as more data is collected for each bill. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an infrared and red light sensor in the currency validation system of Vaks in order to increase the accuracy of the validation system.

Referring to claim 4, using a magnetic sensor, a red light sensor, and an infrared light sensor as the plurality of sensors corresponds to claim 2, wherein the light sensor comprises of red and infrared light sensors (as explained in claim 3).

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37



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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

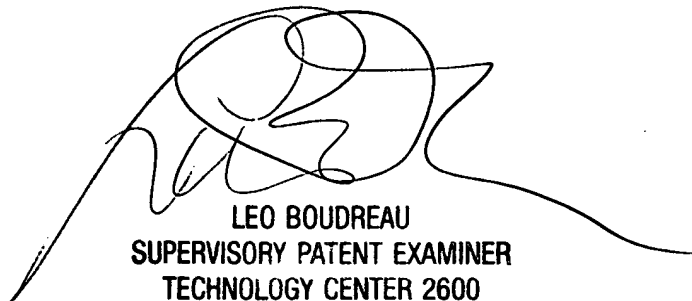
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hussein Akhavannik whose telephone number is (703)306-4049. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on (703)305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hussein Akhavannik  
March 17, 2004

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